

IN THE CLAIMS:

Claim 1 (Currently amended): A method for modification and isolation of a protein, ~~especially whey or soy proteins, characterized in that~~ comprising:

a) providing a protein selected from the group consisting of ~~such as whey or and soy proteins;~~ or concentrate thereof, is brought into contact with

b) providing a reagent that forms sulfite ions ~~in order to sulfonate the protein without using oxidizing agent, and;~~

c) mixing the protein with the reagent under a condition to sulfonate the protein without using an oxidizing agent and to obtain a mixture containing a sulfonated protein;

B8 b)d) precipitating the sulfonated protein ~~once sulfonated is precipitated at an acid pH to form a precipitated sulfonated protein and a soluble sulfonated protein;~~ and

e)e) recovering the precipitated sulfonated protein ~~or the precipitated and/or the soluble sulfonated protein is recovered and optionally processed further.~~

Claim 2 (Currently amended) A method according to claim 1, ~~characterized in that whey or a concentrate thereof is brought into contact~~ wherein the protein is a whey protein and the whey protein is mixed with a the reagent that forms sulfite ions in order to sulfonate the protein at a temperature in a range of 40 – 65 °C, preferred is 50 – 60 °C.

Claim 3 (Currently amended) A method according to claim 1 ~~or 2,~~ ~~characterized in that~~ wherein the whey protein is in a form of a concentrate and has a content of the whey concentrate is concentration of 9 – 12% by weight.

Claim 4 (Currently amended) A method according to claim 1, ~~characterized in that~~ wherein the protein is a soy protein or a concentrate thereof is brought into contact and the soy protein is mixed with a the reagent that forms sulfite ions in

~~order to sulfonate the protein at a temperature in a range of 60 - 80 °C, preferred is 65 - 75 °C.~~

Claim 5 (Currently amended) A method according to claim 1, 2, or 4, ~~characterized in that at (a) wherein the mixing step (c) is carried out at the a pH is adjusted to 5,5 - 8 in a range from 5.5 to 8, preferred is 6 - 7.~~

Claim 6 (Currently amended) A method according to ~~one~~ claim 5, ~~characterized in that in the sulfonation in stage (a) wherein the reagent comprises sulfite is used at having a concentration of 0,02 - 0,20 from 0.02 M to 0.20 M, preferred is 0,05 - 0,10 M.~~

Claim 7 (Currently amended) A method according to claim 1, ~~characterized in that the wherein a degree of sulfonation degree of the protein is affected by varying reaction conditions and amount of reagents used.~~

B8 Claim 8 (Currently amended) A method according to claim 1, ~~characterized in that wherein the sulfonated proteins are protein is precipitated as fractions of varying composition by adjusting the pH.~~

Claim 9 (Currently amended) A method according to claim 8, ~~characterized in that wherein the sulfonated proteins are protein is precipitated by lowering the pH to 1.5 - 5.5 1,5 - 5,5, preferred is 4,0 - 5,0.~~

Claim 10 (Currently amended) A method according to claim 1, ~~characterized in that further comprising a step of removing sulfone groups from the sulfonated proteins or from the precipitated and/or soluble sulfonated protein the sulfone groups are removed and from the same solution protein and the sulfites sulfite ions that did not react with the protein, the removing step comprising by lowering the pH to about 1,5 - 4 1.5 - 4, whereby both the sulfone groups and the sulfite ions are liberated as sulfur dioxide and free sulfhydryl groups are created in the protein.~~

Claim 11 (Currently amended) A method according to claim 1 or claim 10, ~~characterized in that further comprising a step of oxidizing remaining the sulfite ions that did not react with the protein is oxidized to sulfate by blowing air into the mixture at pH 4 - 7.~~

Claim 12 (Currently amended) A method according to claim 1 10,  
~~characterized in that further comprising a step of disulfide groups are formed again~~  
~~from the free sulfhydryl groups by blowing air into the protein mixture at pH 4.5-~~  
~~8.5~~ 4.5-8.5 and at a temperature of 45 - 75°C to form disulfide groups from the free  
sulfhydryl groups in the protein.

Claim 13 (New): A method of claim 1, wherein the protein is in a form of a  
concentrate.

Claim 14 (New): A method of claim 2, wherein the temperature is in the  
range from 50°C to 60°C.

B8 Claim 15 (New): A method of claim 4, wherein the temperature is in the  
range from 65°C to 75°C.

Claim 16 (New): A method of Claim 5, wherein the pH of the mixing step (c)  
is in a range from 6 to 7.

Claim 17 (New): A method of Claim 6, wherein the concentration of sulfite is  
from 0.05M to 0.10 M.

Claim 18 (New): A method of Claim 9, wherein the pH is in a range from 4.0  
to 5.0.

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